

The Effects of Riparian Harvesting on Headwater Stream Chemistry and Modeling of Discharge/Nutrient Exports

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Loss of riparian vegetation during traditional (non-buffered) timber harvest has obvious visual effects on headwater streams with little quantitative data to validate these observations. Research to quantify discharge and nutrient export (C, N, P and major metal ions) from 1st order streams, under different stages of stand development and absence/presence of riparian vegetation, is under way at the Capitol State Forest near Olympia, Wash. The connection of upland soil to stream nutrient export is being explored through soil and sub-surface water analysis. The research emphasis is to address recovery of stream conditions related to stand development. These data will run and calibrate a coupled hydrologic/geochemical model embedded within the PRISM and VSB (Virtual Scalable Basin) framework. This coupled model will predict soluble Carbon and Nitrogen export from these basins with the goal of scalability from headwater basin to regional river systems. The operational predictive model will be applied to address the dissolved oxygen issue in the Hood Canal and land use effects on aquatic habitat. This research is pioneering quantified scientific knowledge of these headwater systems and will promote investigation of scaling issues and data use at varying spatial scales.